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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/695,908

10/30/2003

Yun-Bok Lee

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5675

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10/05/2006

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EXAMINER

KIM, RICHARD H

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/695,908	LEE, YUN-BOK	
	Examiner	Art Unit	
	Richard H. Kim	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 34-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 34-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 34-49 and 51-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 5,946,066) in view of Suzuki et al. (US 5,905,556)

Referring to claims 34 and 53, Lee et al. discloses a device and method comprising a substrate; a plurality of gate lines on the substrate (11); a plurality of data line (12) crossing the gate lines on the substrate to define a pixel region, the data lines having a substantially zigzag shape; a common line (13b) substantially parallel to the gate line on the substrate; a plurality of common electrodes (13a) connected to the common line, the common electrode having a substantially zigzag shape, and having an obtuse angle with the common line; a plurality of pixel electrode (14a) substantially parallel to the common electrodes, the pixel electrodes having a substantially zigzag shape; and a switching element electrically connected to the gate and data lines. However, the reference does not disclose that each of the plurality of common electrodes has a substantially sawtooth-shaped base in a region where each of the common electrodes connects to the common line; and wherein liquid crystal molecules in a portion of a domain near the sawtooth-shaped region and the common line between the corresponding electrodes and pixel electrodes have substantially a same rotational direction as liquid crystal molecules in a remaining portion of the domain.

Suzuki et al. discloses a device wherein each of the common electrodes has a substantially sawtooth-shaped base in a region where each of the common electrodes connects to the common lines and wherein the liquid crystal molecules in a portion of a domain near the sawtooth-shaped region and the common line between the corresponding electrodes and pixel electrodes have substantially a same rotational direction as liquid crystal molecules in a remaining portion of the domain (Fig. 20, ref. R1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a device wherein each of the common electrodes has a substantially sawtooth-shaped base in a region where each of the common electrodes connects to the common lines and wherein the liquid crystal molecules in a portion of a domain near the common line between the corresponding electrodes and pixel electrodes have substantially a same rotational direction as liquid crystal molecules in a remaining portion of the domain since one would be motivated to suppress the creation of extraordinary domains (dark domains) (col. 8, lines 49-50).

Referring to claims 35 and 54, Lee et al. discloses a connecting line (14b) electrically connected to the pixel electrodes.

Referring to claims 36 and 55, Lee et al. discloses that the pixel electrode forms an obtuse angle with the connecting lines (Fig. 3A, ref. 14b, 14a).

Referring to claims 37 and 56, Lee et al. discloses that the connecting line overlaps a portion of the gate line (Fig. 3A, ref. 11, 14b).

Referring to claims 38 and 57, Lee et al. discloses the device wherein the connecting line and the gate line form a storage capacitor. Since structurally the connecting line and the gate line overlap, a storage capacitor would naturally be formed.

Referring to claim 39, Lee et al. discloses the device wherein one of the common electrodes elongates in a direction along the data line and crosses the gate line, wherein the elongated common electrode electrically communicated with adjacent pixel regions (Fig. 3A, ref. 14b).

Referring to claim 40, Lee et al. discloses the device wherein the common line crosses one of the bent portions of each common electrode (Fig. 3A, ref. 14b, 14a).

Referring to claim 41, Lee et al. discloses the device wherein the common line elongates along the gate line (Fig. 3A, ref. 14b, 11).

Referring to claim 42, Lee et al. discloses the device wherein the switching element is formed at a crossing portion of the gate and the data lines. Even though the reference does not explicitly state the limitations, such elements in a liquid crystal device are inherent.

Referring to claim 43, Lee et al. discloses the device wherein the switching element includes a gate electrode, a gate insulator, a semiconductor layer, a source electrode, and a drain electrode. Even though the reference does not explicitly state the limitations, such elements in a liquid crystal device are inherent.

Referring to claim 44, Lee et al. discloses the device wherein one of the pixel electrodes has a bent end portion over the drain electrode (Fig. 3A, ref. 14b).

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Referring to claim 45, Lee et al. discloses the device previously recited, but fails to disclose that the bent end portion overlaps a portion of the drain electrode and contact the drain electrode through the contact hole.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have pixel electrode contact the drain electrode through a contact hole since Examiner takes official notice that using a contact hole to provide electrical contact between the drain electrode and pixel electrode is well known in the art to provide the signal to the pixel electrode.

Referring to claims 46 and 48, Lee et al. discloses the device previously recited, but fails to disclose the device wherein the plurality of pixel electrodes and the connecting line and common electrodes and common lines are formed of a transparent conductive material.

It would have been obvious to one having ordinary skill in the art at the time the invention was made for the pixel electrodes and connecting lines and common electrodes and common lines to be formed of a transparent conductive material since Examiner takes official notice that using a transparent conductive material for the pixel electrode and the connecting lines are well known in the art in order to improve the aperture ratio.

Referring to claims 47 and 49, Lee et al. discloses the device previously recited, but fails to disclose the device wherein the plurality of pixel electrodes and the connecting line and common electrodes and common lines are formed of a opaque metallic material

It would have been obvious to one having ordinary skill in the art for the plurality of pixel electrodes and the connecting line and common electrodes and common lines are formed of a opaque metallic material since using an opaque metallic material for the pixel electrode and

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common electrodes are well known in the art as a efficient means to provide signals to the liquid crystal display layer.

Referring to claims 51 and 58, Lee et al. discloses that the common electrodes have an angle between about 90 degrees and about 180 degrees with the common line (Fig. 3A, ref. 13b, 13a).

Referring to claims 52 and 59, Lee et al. discloses the device wherein the pixel electrode has an angle between 90 degrees and 180 degrees with the connecting line (Fig. 3a, Ref. 14b, 14a).

3. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. and Suzukia in view of Asada et al. (US 5,745,207).

Lee et al. and Suzuki disclose the device previously recited, but fails to disclose the device wherein the common line is connected with other common lines in adjacent pixel regions

Asada et al. discloses the device wherein the common line is connected with other common lines in adjacent pixel regions (Fig. 2, ref. 2a).

It would have been obvious to one having ordinary skill in the art at the time the invention was made for the common line to be connected with other common lines in adjacent pixel regions since one would be motivated to use the same common signal across multiple pixels.

***Response to Arguments***

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard H. Kim whose telephone number is (571)272-2294. The examiner can normally be reached on 9:00-6:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Richard H Kim  
Examiner  
Art Unit 2871

RHK

  
ANDREW SCHECHTER  
PRIMARY EXAMINER